

## **CLAIMS**

1. An intelligent light emitting diode module for a traffic signal; comprising:
  - a voltage source, said voltage source continuously supplying a voltage to said traffic signal;
  - an electronic switch;
  - an integrated flasher;
  - at least one light element;
  - a power supply for powering the at least one light element;
  - 10 a dimming interface for dimming the at least one light element;
  - a controller for generating an appropriate command signal based on one or more status signals,
    - said status signals comprise one or more of the following: light element current, light element voltage, light output, input current and input voltage and said appropriate command comprise one or more of the following: an on or off command, a dimming command, a flashing command, and an emergency disconnection signal;
    - a light sensor for detecting light output of the at least one light element;
    - a voltage detecting circuit for the light element voltage, and the output voltage or combinations thereof; and
  - 20 a current monitoring circuit for measuring the light element current, the output current, or combinations thereof.
- 25 2. The module of claim 1 wherein the light sensor is a photocell mounted adjacent the at least one light element.
3. The module of claim 1 wherein the at least one light element is an LED array.  
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4. The module of claim 1 wherein the controller validates that the light array is functioning using the LED voltage, the LED current and the light output status.  
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5. The module of claim 1 wherein the controller validates the power supply status using the input current and the output current.
6. The module of claim 1 wherein the electronic switch is an on/off switch.  
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7. The module of claim 6 wherein the on/off switch is an opto-triac switch.
8. The module of claim 1 further comprising an emergency disconnect.

9. The module of claim 8 wherein the emergency disconnect is open to a circuit by blowing a fuse.

5 10. The module of claim 1 wherein the integrated flasher comprises a timer circuit.

11. The module of claim 10 wherein the timer circuit switches the electronic switch on and off at a predetermined flashing rate.

10 12. The module of claim 11 wherein the integrated flasher is enabled when the flashing command is generated by the controller.

13. The module of claim 11 wherein the timer circuit is bypassed when the flashing signal is not generated.

15 14. The module of claim 1 wherein the dimming interface decodes the dimming command and adjusts a power converter feedback loop in response to the dimming command.

20 15. The module of claim 14 wherein the dimming command is selected from the group consisting of on/off, linear and pulse width modulation.

16. An intelligent light emitting diode module for a traffic signal; comprising:  
a voltage source, said voltage source continuously supplying a voltage to said  
25 traffic signal;  
at least one LED array;  
a power supply for powering the at least one LED array;  
a controller for generating an appropriate command signal based on one or more  
status signals, said status signals comprise one or more of the following: light element  
30 current, light element voltage, light output, input current and input voltage and said  
appropriate command comprise one or more of the following: an on/off command, a  
dimming command, a flashing command, and an emergency disconnection signal;  
an electronic switch turns the power supply on or off in response to the on/off  
command;

35 a light sensor for detecting light output of the at least one LED array;  
a dimming interface for dimming the at least one LED array, said dimming interface  
capable of adjusting a power converter feedback loop in response to the dimming  
command;

an integrated flasher, said integrated flasher is enabled in response to the flashing command;

a voltage detecting circuit for the light element voltage, and the output voltage or combinations thereof; and

5 a current monitoring circuit for measuring the light element current, the output current, or combinations thereof.

17. The module of claim 16 wherein the controller is enabled to validate the power supply status and that the light array is functioning properly.

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18. The module of claim 16 wherein the integrated flasher comprises a timer circuit, said timer circuit switches the electronic switch on and off at a predetermined flashing rate.

15 19. The module of claim 18 wherein the electronic switch is an opto-triac switch.

20. The module of claim 16 wherein the dimming interface decodes the dimming command and adjusts a power converter feed backloop in response to the dimming command.

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